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MINUTES OF THE 226TH MEETING OF THE
WATER MANAGEMENT BOARD
FLOYD MATTHEW TRAINING CENTER
523 EAST CAPITOL AVENUE
PIERRE, SOUTH DAKOTA

OCTOBER 7, 2020

CALL TO ORDER: Chairman Jim Hutmacher called the meeting to order at 10:00 a.m. Central Time. He announced that the meeting was streaming live on SD.net, a service of South Dakota Public Broadcasting.

The following were present for the meeting:

Board Members: Jim Hutmacher, Rodney Freeman, Leo Holzbauer attended in person, and Tim Bjork, Chad Comes, Peggy Dixon and Bill Larson attended the meeting remotely.

Department of Environment and Natural Resources (DENR): Eric Gronlund, Ron Duvall, Adam Mathiowetz, John Farmer, Timothy Magstadt, and Vickie Maberry, Water Rights Program; Brian Walsh, Office of the Secretary; Kelli Buscher, Jill Riedel, and Patrick Snyder, Surface Water Quality Program; Kim McIntosh, Ground Water Quality Program.

Attorney General's Office: David McVey, board counsel; Ann Mines Baily, Water Rights Program counsel; Steve Blair and Jeffery Tronvold, counsel for the Ground Water Quality Program via remote connection.

Legislative Oversight Committee: Representative Mary Duvall.

Court Reporter: Jacque Weller, Black Hills Reporting.

Motions Concerning Renewal of Ground Water Discharge Plan GWD1-88, Wharf Resources' (USA), Inc. Ross Valley Waste Depository: Julie Santella, Rapid City, SD; Tonia Stands, Oglala, SD; Max Main, Belle Fourche, SD, counsel for Wharf Resources; all via remote connection.

Five Year Review of Fully Appropriated Aquifers: Reed Bixler, Hitchcock, SD, Tulare Western Spink Hitchcock aquifer.

Water Permit Application No. 8413-3, Ratio LLC: Patricia Moriarty and Robert Moriarty, St. Lawrence, SD; Todd Wilkenson, Kirk Aughenbaugh, and Adam Aughenbaugh, DeSmet, SD; and Nick Fitzgerald, Tipton, IA.

ADOPT FINAL AGENDA: Motion by Freeman, seconded by Holzbauer, to adopt the agenda. A roll call vote was taken and the motion carried unanimously.

CONFLICT DISCLOSURES AND REQUESTS FOR STATE BOARD WAIVERS: None.

ADOPT JULY 8-9, 2020 BOARD MINUTES: Motion by Bjork, seconded by Freeman, to approve the minutes from the July 8-9, 2020, Water Management Board meeting. A roll call vote was taken, and the motion carried with Bjork, Freeman, Holzbauer, Larson, and Hutmacher voting aye. Comes and Dixon abstained.

DECEMBER 2-3, 2020 MEETING AND LOCATION: The next meeting is scheduled for December 2-3, 2020, in Pierre.

STATUS AND REVIEW OF WATER RIGHTS LITIGATION: Mr. McVey stated that there was nothing to report regarding litigation.

ADMINISTER OATH TO DENR STAFF: The court reporter administered the oath to the DENR staff who were present and intended to testify during the meeting.

UPDATE ON DENR ACTIVITIES: Eric Gronlund reported on the construction taking place in the Foss Building. There will be a receptionist in the lobby area of the building, and the area where staff are located will be by security code access. Two restrooms are also being constructed on the west side of the Matthew Training Center meeting room.

Mr. Gronlund stated that Governor Noem announced that she plans to merge the Department of Agriculture and the Department of Environment and Natural Resources. The Governor appointed current DENR Secretary Hunter Roberts to serve as Interim Secretary of the Department of Agriculture. During the first five days of the 2021 Legislative Session, the Governor will issue an Executive Order merging the two departments. Subject to legislative approval, ninety days after the Governor issues the Executive Order the merger becomes effective and the Department of Agriculture and Natural Resources will be established.

Mr. Gronlund noted that the merger will have very little effect on the duties of the Water Management Board. He answered questions from the board members.

PUBLIC COMMENT PERIOD IN ACCORDANCE WITH SDCL 1-25-1: There were no public comments.

REQUEST TO AMEND RULES: Kelli Buscher, administrator of the DENR Surface Water Quality Program, introduced Patrick Snyder and Jill Riedel who provided slide presentations and discussed a brief overview of proposed amendments to ARSD 74:52, Surface Water Discharge Permits and ARSD 74:51 Surface Water Quality. A copy of the slide presentation is attached at the end of the minutes.

Information on the proposed rule changes is available on the department's website.

Following the presentations, Ms. Buscher requested permission to advertise for a hearing to consider adoption of proposed amendments to the rules.

Motion by Motion by Freeman, seconded by Holzbauer, to authorize the department to advertise for a hearing to consider amendments to ARSD 74:52, Surface Water Discharge Permits and ARSD 74:51 Surface Water Quality. A roll call vote was taken and the motion carried unanimously.

MOTIONS CONCERNING RENEWAL OF GROUND WATER DISCHARGE PLAN GWD 1-88,
WHARF RESOURCES (USA), INC. ROSS VALLEY WASTE DEPOSITORY: Chairman
Hutmacher opened the hearing.

Following notice of DENR's recommendation that Wharf Resources' Ross Valley spent ore facility ground water discharge plan be renewed with conditions, petitions to contest and oppose the renewal application for the Ground Water Discharge Plan were filed by Julie Santella and Tonia Stands.

Assistant Attorney General Steve Blair, counsel for the DENR Ground Water Quality Program, and Max Main, counsel for Wharf Resources, both filed motions to dismiss.

Max Main, attorney from Belle Fourche, represented Wharf Resources.

Steve Blair and Jeffery Tronvold, Assistant Attorneys General, represented the DENR Ground Water Quality Program.

Julie Santella and Tonia Stands, petitioners, appeared pro se.

Chairman Hutmacher requested arguments on the Motion to Dismiss.

Mr. Blair stated that Wharf Resources submitted its renewal of the Ross Valley spent ore facility Ground Water Discharge Plan in November 2019. After the plan was reviewed and determined complete by department staff, a Notice of Recommendation was issued by Secretary Roberts. The Notice of Recommendation was published on August 1, 2020, and the deadline to file a petition for a contested case was August 31, 2020. During the late evening of September 1, 2020, the department electronically received petitions to contest and oppose the renewal of the Ground Water Discharge Plan from Julie Santella and Tonia Stands. The emailed petitions were marked received on September 2, 2020. Written petitions were received in the U.S. Postal Service mail on September 4, 2020.

Mr. Blair stated that the basis of the department's motion to dismiss is essentially that because the 30-day deadline expired on August 31, 2020, the period to file a timely petition had expired at the time the petitions were received from Ms. Santella and Ms. Stands. There are two parts to the Ground Water Discharge Plan for the Ross Valley Facility. One is the Ground Water Discharge Permit and the other is a Water Quality Variance. Both of those components have administrative rules that require petitions to be filed within 30 days of the Notice of Recommendation. Mr. Blair stated that Ms. Santella had filed a response to the department's Motion to Dismiss. He said he believes Ms. Stands also filed a response regarding the Motion to Dismiss, but he did not receive a copy of it.

Mr. Blair stated that in her response, Ms. Santella indicated that she had received email correspondence from Ron Duvall stating that the petition deadline was September 1, 2020. Mr. Blair said at the time he filed the department's motion, neither he nor anyone in the department was aware that this clerical error had been made in that email correspondence. He said the department does not dispute that the incorrect date was cited in the email, but even with that clerical error that does not trump the 30-day period in administrative rule. Both ARSD 74:54:02:08 and ARSD 74:54:02:12

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include language that states that if the petition is not filed, the application for the Ground Water Discharge Plan becomes final without a hearing. Mr. Blair noted that in that email a link was provided to the Notice of Recommendation public notice. The public notice clearly indicates that there is a 30-day period from the time of publication to file petitions. The public notice also provides reference to applicable rules in ARSD 74:50 that the board follows for these Ground Water Discharge Plans.

Mr. Blair said it is the department's position that the petitions were untimely, even considering the clerical error that was made. He requested that the board dismiss the petitions.

Mr. Blair stated that if the department were to accept that the email clerical error extended the petitioning period, the department would still submit that the only correspondence that could fit within the timeline would be the emails received from Ms. Santella and Ms. Stands on the evening of September 1.

Mr. Blair said the department does not believe email is sufficient to file a petition with the board to initiate a contested case. He said ARSD 74:50:02, the contested case procedures, is silent on what is an acceptable method of filing a petition. ARSD 74:50:02:02 states that a person must file a petition for a contested case. ARSD 74:50:02:07 requires the original of the petition to be filed with the department, and ARSD 74:50:02:15 requires service of pleadings to be made by Certified Mail. Mr. Blair said the most reasonable interpretation of the rules is that a petition should be filed by U.S. mail. He said without a specific statute or rule allowing electronic service, it is the department's position that those emailed petitions that were submitted for filing on September 1, 2020, are not a valid form of filing a contested case petition. He stated that the department believes the petitions are untimely because the hard copies of the petitions are postmarked September 2 and were received by the department on September 4, 2020.

Max Main said he would join with the department to move to dismiss these petitions as being untimely. The Notice of Recommendation published on August 1, 2020, clearly states that the time in which to file a petition for a contested case hearing is 30 days. He stated that even the emailed petitions did not meet that timeline. The administrative rules provide that if there is no petition timely received, then the Ground Water Discharge Plan is approved. Mr. Main stated that these petitions must be dismissed because they were not timely received, and the Ground Water Discharge Plan is already in place.

Mr. Main stated that there is no rule that allows for filing of petitions by email. ARSD 74:50:02:07 says that the originals of all pleadings must be filed with DENR. He said that rule requires filing by mail, not filing by email.

Mr. Main requested that the petitions be dismissed.

Julie Santella stated that Mr. Duvall's email on August 3, 2020, stated that the comment deadline was September 1, 2020. She stated that 30 days from August 1 is September 1. Ms. Santella said she filed the petition via email on September 1, 2020, at 7:41 p.m., and she believes she fulfilled what she knew was required to contest the renewal application.

Ms. Santella said this intervention process is meant to be a way for DENR to invite public input, and she has heard DENR staff present say such on multiple occasions. She asked the board to recognize that, as a layman pro se intervenor and someone without legal training, she met the deadline given to her and fulfilled the requirements the best way she knew how. She requested that the board allow her petition.

Tonia Stands stated that she is an enrolled member of the Oglala Sioux Tribe who partakes in ceremonial practices around these water permits and works with tribal officials and South Dakota legislators to try to keep up with these permits. She said the process is not very network-oriented, so it is very difficult to get these permits attended to by the legislators or by tribal and spiritual leaders. Ms. Stands said she filed her petition within the 30-day timeline. She also stated that she did not see the Notice of Recommendation in any newspapers or on any of the social media websites that might offer that. She asked the board to allow her petition.

Mr. Blair stated that the only legal publication for these notices is in a newspaper, and the Affidavit of Publication from the Black Hills Pioneer was included in the pleadings. That is the only legal communication that triggers the notice period. The email that goes out from the department updating the public notices page is a courtesy email; not the legal notice. Anything that might be communicated on social media is also not the legal publication that triggers the petition period in these matters. The Black Hills Pioneer is the legal newspaper that this matter was required to be published in considering the geographic location of the Wharf mine, and that is the publication that is of concern in considering the triggering of the 30-day petition deadline.

Chairman Hutmacher requested board action.

Mr. Bjork stated that the board needs to be very careful when talking about electronic communications and whether or not they are valid or legal. He said considering all of the changes that are happening in this day and age, the board shouldn't say that these types of communications are not valid because the board would be setting a kind of precedent that may get them into trouble. He stated that as the board considers this, it should talk about the issue of whether or not the filing has been timely.

Chairman Hutmacher said there may be some adjustments that need to be made, but that is something the legislature is going to have to do. Mr. Bjork said he agreed.

Mr. Freeman stated that the rules clearly provide that if no petitions are received within 30 days after publication, the Ground Water Discharge Plan is automatically approved. He said the petitions were not received by August 31, which is the 30th day.

Motion by Freeman, seconded by Larson, to grant the Motions to Dismiss. A roll call vote was taken, and the motion carried unanimously.

Mr. Blair will prepare a proposed Order and distribute it to the parties.

FIVE-YEAR REVIEW OF FULLY APPROPRIATED AQUIFERS: Eric Gronlund reported that this hearing is for the five-year review of the two fully appropriated aquifers: the East James management unit of the Tulare Aquifer commonly known as the Tulare East James and the Western

Spink Hitchcock management unit of the Tulare Aquifer commonly known as the Tulare Western Spink Hitchcock.

The aquifers are located primarily in Beadle and Spink counties north of Huron. The Tulare East James is on the east side of the James River, and the Tulare Western Spink Hitchcock is on the west side of the James River.

Tulare East James Aquifer History

For all practical purposes, the aquifer was closed to new appropriations in 1981 largely due to declining water levels in area observation wells. There were essentially no new appropriations from the aquifer for over 20 years.

In 2003, the Water Management Board cancelled a water permit on land owned by Philip Hines. Mr. Hines subsequently filed a water permit application for 1 cfs for 91 acres of irrigation. The permit was denied, but the decision was reversed on appeal by the late Judge Max Gors. The message from that decision was that if the average estimated annual recharge is used, the average estimated annual withdrawals also needs to be used.

Additional applications were filed soon after which led to seven water permits being issued before DENR again began recommending denial of applications from the aquifer.

In 2012, a number of applications were filed. A reassessment of the aquifer was done by Ken Buhler, and it was found that 10 water permits totaling 1,759 acres could be issued. After again determining that the aquifer was fully appropriated, future applications were denied.

Mr. Gronlund stated that a total of 16,674 acres are currently authorized for irrigation.

Tulare Western Spink Hitchcock History

New permits were routinely being issued from the Tulare:Hitchcock and the Tulare:Western Spink aquifers. Numerous applications were filed in 2002 that lead to a hearing before the board in December 2002. At that time, the management units were combined to become the Tulare Western Spink Hitchcock aquifer, and permits for 2,654 acres were approved. The remaining applications were deferred. The board set forth a 5-year moratorium on issuance of new permits to allow the existing permits to be developed and to reassess the aquifer. The number of deferred applications grew to 37 and were brought back before the board in 2007 at which time they all were denied.

Applications were approved in 2012 for 810 acres of irrigation based on reassessment of the aquifer. In 2013, a total of 4,706 acres of irrigation were approved prior to the board determination of full appropriation.

As of 2020, there are 26,105 acres authorized from the Tulare Western Spink Hitchcock Aquifer.

Mr. Gronlund stated that the closing and re-opening of the two aquifers led to a question of fairness from landowners, Water Management Board members, Legislators and staff as it became viewed as a race to the front door to file an application if someone thought water was available. One landowner was even filing a reoccurring application.

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This led to legislation that was passed by the Legislature during the 2014 Session. The legislation required a public notice providing notice of a thirty-day period for applications to be accepted and held for future consideration. Applications filed during this period were assigned a common priority date.

The Board then conducted a random selection process in May 2015 to establish a priority list to determine the order of eligibility if unappropriated water is determined to be available at a future date.

The legislation provided that at least every five years a public hearing be held to review the groundwater source to determine whether unappropriated water is available. The law calls for a review, as such, this is not a contested case.

Mr. Gronlund stated that notice of today's public hearing was published in the Aberdeen, Redfield, Miller and Huron newspapers. Notice was also provided to each applicant holding one or more applications on the priority list.

If water is determined to be available, the statute provides that the applications be processed in accordance with SDCL 46-2A until the board determines the groundwater source to again be fully appropriated. Any remaining applications stay on the priority list for future five-year reviews by the board.

Mr. Gronlund said the reason the board is here today is to conduct a five-year review of these two aquifers. Over the years, this board first saw Jim Goodman, then Ken Buhler present on behalf of DENR when water permit applications were filed. Both are respected engineers and experts in their field, and both are also retired.

Mr. Gronlund stated that John Farmer prepared the two reports that were included in the board packet. He noted that this is the first time staff has gone through the five-year review process, so it was a learning curve for them. Following this five-year review presentation, staff plans to discuss ways to enhance future reviews.

Mr. Gronlund said in his opinion, Mr. Farmer approached this much the same way a new water permit application is approached in determining whether unappropriated water is available. The board is charged with determining whether unappropriated water is available. The board has to weigh the foundational water right statute, SDCL 46-1-4, that the water resources of the state be put to beneficial use to the fullest extent of which they are capable, with SDCL 46-6-3.1, which requires balance between the average estimated annual recharge and average estimated annual withdrawal so that in the long-term more water is not being withdrawn than is recharged.

Mr. Gronlund stated that he would discuss his recommendation following Mr. Farmer's presentation.

Mr. Farmer provided a slide presentation and discussed his report on the five-year review of water availability in the Tulare East James Aquifer. He discussed the history, statutes, observation well analysis, potentiometric surface, hydrologic budget (recharge/withdrawals) and his conclusions. A copy of the report was included in the board packet and a copy of the slide presentation is attached to the minutes.

Mr. Gronlund stated that after reviewing the report on the status of the Tulare East James Aquifer he was unable to reach a conclusion that unappropriated water is available. This is based on evaluating the best information available regarding observation well data, reported withdrawals, and published recharge rates. While the observation wells indicate that the aquifer reacts to climatic conditions and has been at relatively high levels in relation to historical records, the last seven years indicates a decline following recent development in the aquifer. The hydrologic budget also showed that the estimated average annual withdrawal is greater than the recharge as modeled by Kuiper and the estimates made by Goodman & Buhler (7,950 and 7,827 ac-ft/yr).

Mr. Gronlund concluded that at this time there is not unappropriated water available from the Tulare East James Aquifer.

Mr. Farmer and Mr. Gronlund answered questions from the board.

Motion by Freeman, seconded by Bjork, to approve the report on the five-year review of the Tulare East James Aquifer and to maintain the appropriation as is for the next five years. A roll call vote was taken, and the motion carried unanimously.

Mr. Farmer provided a slide presentation and discussed his report on the five-year review of water availability in the Tulare Western Spink Hitchcock Aquifer. He discussed the history, statutes, observation well analysis, potentiometric surface, hydrologic budget (recharge/withdrawals) and his conclusions. A copy of the report was included in the board packet and a copy of the slide presentation is attached to the minutes.

Mr. Gronlund stated that he appreciates the work Mr. Farmer put into his five-year review of the Tulare Western Spink Hitchcock Aquifer. Mr. Farmer approached this much like he would when reviewing a new water permit application. The report relied on past information and studies as well as a detailed look into observation wells, application rates and utilization rates.

Mr. Gronlund said the report underwent a peer review by other Water Rights Program staff, and staff had spirited discussion with differing views on the position of whether unappropriated water is available.

Back in the early 2000's the hydrologic budget was primarily used for determining whether unappropriated water is available and the observation well records were used to gage the impacts. However, it transitioned to reliance on observation well records during the period when applications came before the board around the 2012 - 2013 period. This was largely due the board rule that observation well measurements be used when regulating water withdrawals and determining the availability of unappropriated water. However, importantly, that rule also includes the words "in addition to other data."

Mr. Gronlund said he recognizes DENR always emphasized needing to look at the entire period of record when making decisions. However, when the new appropriations are being developed, using the long-term observation well water levels is not fully representing the aquifer at its current state of development. This is the reason Mr. Farmer included in his report various periods of record.

Mr. Gronlund said a hybrid approach that includes a combined look at observation well records over the long term, shorter periods and the hydrologic budget is necessary today. He said there is a lot of information on this management unit of the Tulare aquifer in comparison to other water sources the Board deals with. The department does not have all the information it wants, and it is unlikely we will ever know everything. Mr. Gronlund said it comes down to making an engineering judgement and in doing so, views may differ.

State law requires a balance of SDCL 46-1-4 requiring water to be put to the fullest extent it is capable with SDCL 46-6-3.1, which provides that over the long-term we do not withdraw more than is recharged so the resource is maintained into perpetuity.

Mr. Gronlund said Mr. Farmer took a very conservative approach in using a 100% utilization rate in determining withdrawals from the aquifer. It is undeniable that the utilization rate for irrigation in the aquifer has risen, and Mr. Gronlund said he does not see it decreasing due to the technology that allows producers to better manage the land. However, he takes a somewhat more progressive approach in looking at the balance. He said he does not believe a 100% utilization rate will ever be attained. Also, in looking at the observation well records for the various period of records, he is of the opinion that they provide a representation that some unappropriated water may be available. Mr. Gronlund said taking this hybrid approach he believes, in his engineering judgement, that a limited quantity of unappropriated water is available.

He requested that the board make a finding that a limited quantity of unappropriated water is available in the Tulare Western Spink Hitchcock Aquifer.

Mr. Farmer and Mr. Gronlund answered questions from the board.

The board expressed concerns about not over-appropriating the aquifer. The board suggested waiting a few more years to see if water is available before granting any new water permits.

Motion by Freeman, seconded by Holzbauer, to approve the report and to maintain the appropriation as is for the Tulare Western Spink Hitchcock Aquifer for the next five years. A roll call vote was taken, and the motion carried unanimously.

UNOPPOSED NEW WATER PERMITS ISSUED BASED ON THE CHIEF ENGINEER RECOMMENDATIONS: Prior to the meeting the board received a copy of the table listing the unopposed new water permits issued by the chief engineer. (See attachment.)

WATER PERMIT APPLICATION NO. 8413-3, RATIO LLC: Chairman Hutmacher opened the hearing.

Todd Wilkinson, attorney from DeSmet, SD, represented Ratio, LLC.

Ann Mines Bailey, Assistant Attorney General, represented the Water Rights Program.

Patricia Moriarty, St. Lawrence, SD, petitioner appeared pro se.

The parties stipulated that the Water Rights Program present its case first.

The parties waived opening statements.

Ms. Mines Bailey offered DENR Exhibit 1, the administrative file. The exhibit was admitted into the record.

Timothy Magstadt, Engineer II with the DENR Water Rights Program, was administered the oath by the court reporter and testified regarding his report on Ratio, LLC. The report was included in the board packet.

Ms. Mines Bailey offered DENR Exhibit 2, the resume of Timothy Magstadt. The exhibit was admitted into the record.

Responding to questions from Ms. Mines Bailey, Mr. Magstadt testified that he graduated with a bachelor's degree in geological engineering from the South Dakota School of Mines and Technology and has been employed at DENR for about two years. Mr. Magstadt testified regarding his job responsibilities.

Mr. Magstadt testified that Water Permit Application No. 8413-3 is for commercial use of 77 acre-feet of water annually at a maximum instantaneous rate of 0.134 cubic feet per second (cfs) from two wells to be completed into the Niobrara aquifer (325-350 feet deep) or the Dakota aquifer (1,300–1,500 feet deep) for use in a swine production facility to be located approximately 10 miles southeast of Miller SD.

The applicant originally proposed using a glacial aquifer in the area. Mr. Magstadt conducted an initial review in that area and after looking at nearby lithologic logs and having the applicant drill a test hole, he deemed that the glacial aquifer in that area was not large enough to supply the applicant's needs. As a result, a test hole was drilled to see if the Niobrara was present in that area. After drilling they were not able to get past the Pierre Shale, which overlies the Niobrara Aquifer and, as such, it was not confirmed whether or not the Niobrara was present at that location. This application allows them to go down to the underlying Dakota Aquifer if, during the time of drilling, they do not have enough thickness in the Niobrara Aquifer.

The report references pending Permit Application Nos. 8416-3, 8421-3, and 8423-3. Mr. Magstadt pointed out that these permits have been approved since the writing of the report. Approval of those permits does not change his analysis, and the amounts appropriated were figured into his analysis as being used. On page 14 in paragraph 1, Observation Well "HD-85A" should be "HD-87A."

In response to questions from Ms. Mines Bailey, Mr. Magstadt testified that the Niobrara Aquifer is present primarily east of the Missouri River and is comprised of chalk, marl, and shale. In Hand County, the areal extent of the aquifer is estimated to be approximately 210,000 acres. There is no estimate of the amount of storage in the Niobrara Aquifer. The thickness of the Niobrara formation in this area is expected to be 25 to 100 feet. The Niobrara aquifer is expected to be under confined conditions in this area. Approximately five miles to the southwest there is an existing water right completed into the Niobrara Aquifer. At the time of completion, the well completion report noted a static water level, or in this case, artesian head pressure, of 130 to 180 feet.

Recharge to the Niobrara aquifer occurs through infiltration of snowmelt and precipitation and inflow from the Dakota and Codell aquifers. No studies have been done to calculate recharge for the Niobrara Aquifer. The best information available regarding recharge to the Niobrara Aquifer is the existing Observation Well Network. There are 57 observation wells in the Niobrara Aquifer. Mr. Magstadt reviewed all 57 observation wells, but he only included the two observation wells that are the nearest to the proposed diversion point in his report. Overall, the observation wells show that recharge to the Niobrara is greater than discharge. Withdrawals from this aquifer primarily occur due to evapotranspiration where the outcrop is near land surface, outflow to other aquifers and rivers, and well withdrawals. The total estimated withdrawal from the Niobrara Aquifer is 3,948 acre-feet yearly. The estimate is based on applications that were pending during that time, non-irrigation rights and permits, and irrigation rights and permits. For pending applications, it was assumed that they would use the entire permitted amount. Non-irrigation use was calculated assuming that application for water rights or permits that are limited by a diversion rate would pump their diversion rate 60% of the time and if they were limited by volume that they would use that entire volume every year. Irrigation water rights and permits were calculated using irrigation questionnaires that were submitted to the Water Rights Program. Currently, there are 83 water rights/permits appropriating water from the Niobrara aquifer. The nearest water right/permit completed into the Niobrara aquifer is approximately five miles to the southwest of the proposed diversion point. This water right is held by Sunshine Bible Academy, which is considered an institutional use. There are several domestic wells in the area. The closest domestic well on file with the Water Rights Program is approximately 1.5 miles to the northwest of the proposed diversion point. Given that there are glacial aquifers available at shallower depths, it would be unlikely for domestic wells to be completed into the Niobrara Aquifer in this area.

Mr. Magstadt concluded that unappropriated water is available from the Niobrara for this appropriation, and due to the estimated artesian head pressure in the area, distance to the nearest domestic user, and the nearest right or permit on file, unlawful impairment will not occur.

The Dakota Aquifer is present throughout South Dakota and is composed primarily of sandstone, quartz, and shale. The areal extent the Dakota Aquifer in Hand County it is estimated to be 912,640 acres. It is estimated that 22,245,600 acre-feet of water in storage is present in Hand County.

In Hand County it has been noted that the minimum of the Dakota Aquifer thickness is 200 feet and the maximum is 320 feet. In this area, the aquifer is confined and the artesian head pressure ranges between 970 feet to 1,230 feet.

Observation wells show that recharge to the Dakota Aquifer is greater than discharge. Recharge to the Dakota aquifer occurs through the infiltration of precipitation in areas of the Black Hills where the Newcastle Sandstone outcrops, leakage through confining layers, and by upward leakage from deeper aquifers. Recharge to the Dakota aquifer in its entirety has not been quantified. Mr. Magstadt stated that in the report he cites a model that takes into account the recharge that occurs through confining layers. The model estimated that 56,700 acre-feet per year was coming from confining layers. This is a "ballpark" number, and there are assumptions made with this model.

In addition to the model, Mr. Magstadt looked at observation wells completed into the Dakota Aquifer. The Water Rights Program monitors 46 observations wells completed into the Dakota Aquifer. Mr. Magstadt said he reviewed all 46 of the wells, but only included two wells in the report;

the nearest well to the proposed diversion point and a well that is an example of where the Dakota Aquifer is equilibrating. The observation well data overall shows that the Dakota Aquifer is in a state of equilibrating and that as the artesian head pressure in the aquifer drops, wells that are flowing to waste are no longer flowing. Over time these observation wells should eventually reach an equilibrium. Mr. Magstadt said the data indicates that unappropriated water is available.

Currently, the primary withdrawals from the Dakota Aquifer are leakage to confining layers, outflow where the Dakota Aquifer outcrops, uncontrolled flowing wells, outflow to adjacent aquifers, and well withdrawals. Mr. Magstadt stated that the total well withdrawals are estimated to be 24,485 acre feet per year. He estimated the Dakota Aquifer withdrawals by taking into account pending applications, non-irrigation rights and permits, irrigation rights and permits, and future use permits. For pending applications, it was assumed that they would use the entire permitted amount. Non-irrigation use was calculated assuming that application for water rights or permits that are limited by a diversion rate would pump their diversion rate 60% of the time and if they were limited by volume that they would use that entire volume every year. Irrigation water rights and permits were calculated using irrigation questionnaires that were submitted to the Water Rights Program. Future use permits were assumed to use their entire volume.

Based on the review of recharge and withdrawal, Mr. Magstadt's opinion is that unappropriated water is available for this diversion.

Mr. Magstadt also conducted an unlawful impairment review of the Dakota Aquifer. Currently, there are 238 water rights/permits completed into the Dakota aquifer. The nearest water right/permit completed into the Dakota aquifer is approximately nine miles to the north of the proposed diversion point and is for commercial use. There are several domestic wells in the area. The closest domestic well on file with the Water Rights Program is approximately 1.5 miles to the northwest of the proposed diversion point. Given the depth of the Dakota aquifer expected to be 1300 to 1500 feet and that there are glacial aquifers available at shallower depths, it would be unlikely for domestic wells to be completed into the Dakota Aquifer in this area. Mr. Magstadt concluded that there is a reasonable probability that the diversion proposed by this application will not unlawfully impact adequate wells for existing water rights and domestic use.

Mr. Magstadt stated that he reviewed the petitions filed by Patricia Moriarty, St. Lawrence, SD and Brian Caruso with the Fish and Wildlife Service.

Mr. Magstadt's understanding of the Fish and Wildlife concern is the potential drop in water levels of nearby lakes and water quality, if completed into the glacial aquifer. He stated that the application is no longer for a glacial aquifer, so this appropriation is unlikely to affect water levels in nearby lakes. Mr. Magstadt said the water quality concerns expressed by the Fish and Wildlife Service are out of the scope of his review and outside the area of his expertise.

Mr. Magstadt said based on the letter received from Patricia Moriarty, his understanding of her concerns to be the potential for depletion of her existing domestic water supply completed to a depth of 300 feet and a concern regarding water quality. Based on the lithologic log located approximately 0.14 miles to the northwest of Patricia Moriarty's home and based on the depth of her well indicated in the letter to be at 300 feet, Mr. Magstadt said he would consider that well completed into a glacial aquifer and, as such, this appropriation is unlikely to affect the water levels of the well. He said the

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water quality concerns expressed by Ms. Moriarty are out of the scope of his review and outside the area of his expertise.

This concluded questioning by Ms. Mines Bailey.

Mr. Wilkenson had no questions of Mr. Magstadt.

Ms. Moriarty stated that she has a 300 foot well and a 1,600 foot well. She asked if this application would affect the 1,600 feet well.

Mr. Magstadt stated that given that the well is 1,600 feet, he would assume that the well is completed into the Dakota Aquifer. In this area with the artesian head pressure and the distance to the proposed diversion point, he would not expect the well to be unlawfully impaired.

Ms. Moriarty said she has trouble watering livestock with the two wells, so she would hate for the proposed wells to impede her water by Ratio LLC taking so much water out of the aquifer. She asked what happens in a dry year.

Mr. Magstadt answered that Ms. Moriarty may have to lower the pump in the well if it is not far enough into the Dakota Aquifer. As to a loss in hydraulic head, he would not expect a significant loss due to the proposed diversion.

Ms. Moriarty said Ratio LLC plans to withdraw 40,000 gallons per day. She asked if this is the maximum amount they can take out per day. Mr. Magstadt said if that converts to 0.134 cfs.

Ms. Moriarty asked if there will be a meter on the wells. Mr. Magstadt said he does not believe Ratio LLC will be required to meter the wells, but when a pump is installed, that pump has to be capable of only diverting the amount that is allowed in the permit if he was understanding that correctly.

There were no questions from the board members.

Ms. Mines Bailey called Eric Gronlund who had previously been administered the oath.

Responding to a question from Ms. Mines Bailey, Mr. Gronlund, chief engineer, testified that he recommended approval of the application. He noted that in his recommendation, which was included in the board packet, the word "well" should be "wells" in Qualification Nos. 1, 2, and 3. In the first line of Qualification No. 2, "single" should be "the same."

There were no other questions of Mr. Gronlund.

Mr. Wilkenson called Kirk Aughenbaugh who was administered the oath by the court reporter.

Mr. Wilkenson offered Applicant Exhibits A, B, and C, slide presentations.

Responding to questions from Mr. Wilkenson, Mr. Aughenbaugh testified that he is one of the members of Ratio, LLC, and he submitted the water permit application. He testified regarding Exhibit A, which is a slide presentation showing the location of the proposed Ratio, LLC sow farm,

residential setback distances, the approved site plan, what is included in the sow farm, the reasons Ratio LLC chose South Dakota, the benefits to South Dakota communities, the indirect benefits, a summary of Ratio, LLC and the proposed project, and community involvement.

Mr. Aughenbaugh testified that the farm is located approximately 9.7 miles south/southeast of Miller, SD in Pearl Township. The proposed farm exceeds the residential setbacks of two miles. The nearest resident is approximately 2.75 miles from the farm. Farm distance from surface water exceeds the setback of 660 feet. The distance from the south lake is 772.51 feet, and the distance from the north lake is 1,079.35 feet. Stockwell Engineering and Pipestone designed the state-of-the-art facility. The multiplier site plan includes a farrowing barn, gestation barn, and a GDU barn. The sow farm includes five buildings that are engineered with the newest technology. The buildings include a gestation barn, a farrowing barn, a gilt growing barn, a compost building, and a small storage shed. There will be a cafeteria and breakroom on the farm for the employees. The estimated state and local economic impact totals nearly \$3 million annually. Indirect benefits include 18 full-time employment opportunities, utilities and services used on the farm, and feed purchases increasing local demand for grains rather than relying on exports.

Mr. Aughenbaugh testified Pipestone sow unit projects improve farmers competitiveness in today's global market. They are owned by independent family farms and provide good jobs with career paths in agriculture for folks in rural communities. Organic nutrients improve local farmers' yields and cost efficiency, local grain basis for farmers, and increase local and state tax revenues.

Mr. Aughenbaugh stated that the Pipestone Cares Program donated \$100,000.00 to farm communities last year. Over the last two years, Pipestone's "Give a Helping Ham" campaign has given 150,000 pounds of pork to Feeding South Dakota.

Responding to questions from Mr. Wilkenson, Mr. Aughenbaugh stated that this is a deep pit unit. Ratio, LLC went through the permitting process with DENR, and the facility is permitted for 9,060 animals. Ratio, LLC also applied for and was granted a Conditional Use Permit from the local county planning and zoning office. One of the conditions in the permit is the availability of water to serve the facility. Ratio, LLC intends to obtain the water through either the Niobrara Aquifer or the Dakota Aquifer. Mr. Aughenbaugh stated that Ratio, LLC will not be obtaining water from the glacial aquifer. Regarding water quality in the area, Mr. Aughenbaugh said all the manure will be contained within the facility, and the manure will be knifed in. Ratio, LLC understands and acknowledges that the wells will be constructed in accordance with state well requirements.

Exhibits B and C include various South Dakota well and test hole plugging reports. Mr. Aughenbaugh stated that the use of the water for this facility will be a beneficial use.

Responding to questions from Ms. Moriarty, Mr. Aughenbaugh stated that the holding tank for the manure is made of cement. The holding tank has been designed to the standards that have been put forth for this operation.

Ms. Moriarty stated that over time cement tends to crack, so whatever is in the tank will leak. She asked if there will be a liner in the tank. Mr. Aughenbaugh asked that the question be presented to Nick Fitzgerald with Pipestone.

Ms. Mines Bailey had no questions.

Responding to questions from Mr. Holzbauer regarding the manure and roads, Mr. Aughenbaugh stated that the storage capacity for the manure exceeds one year. All of the acres in the nutrient management plan are contiguous, so no public roads will be used to haul the manure; large hoses will be used. A road haul agreement with the county is in place to use the county road to haul hogs, feed, etc. in and out of the facility.

Mr. Wilkenson called Nick Fitzgerald, Pipestone, who was administered the oath by the court reporter.

Responding to questions from Mr. Wilkenson, Mr. Fitzgerald testified that the storage for the manure at this facility is a deep structure and it is a zero-discharge facility. The holding tanks for the manure are ten feet deep pits, which exceed the DENR requirements in terms of storage capacity. Twelve months of storage is designed for this farm. This farm is engineered per state standards.

Mr. Fitzgerald stated that regarding the question asked of Mr. Aughenbaugh regarding the cement cracking, Stockwell Engineering is the firm that was deployed for this project, and he cannot speak to the cracking of the concrete. He said the state has set design standards for this type of facility, and the Ratio, LLC facility will meet or exceed all the design standards. This site passed all soil boring requirements.

Ms. Moriarty asked if there is a liner in the storage pit and what will happen when the cement cracks and leaks. Mr. Fitzgerald stated that there is no liner within the cement storage pit. This facility is engineered and designed to meet or exceed all state and local requirements. Ms. Moriarty asked what will happen when the cracks and how will Ratio, LLC know that the manure is leaking out of the pit. Mr. Fitzgerald stated that as the management company, Pipestone is responsible for providing an operation and maintenance program, which includes daily, weekly, and monthly observations both inside and outside of the facility. Ms. Moriarty said when it leaks it will go into the groundwater, into the well, and into the lakes. She asked how that will be addressed. Mr. Fitzgerald answered that this facility is designed to meet or exceed all state and local requirements. Ms. Moriarty stated that someone who wished to remain anonymous told her that it's not, if it's going to leak, it's when it's going to leak. She said she does not know how Pipestone is going to be able to protect the water source when it starts leaking. Mr. Fitzgerald said he is not aware of the particular situation Mr. Moriarty is referring to. Ms. Moriarty said the person is someone that has been around these things before, and apparently the person knows that they do leak.

Mr. Wilkenson objected to the form of Ms. Moriarty question as someone anonymous is not present is asking the question. The objection was overruled by Chairman Hutmacher.

Ms. Moriarty said cement does crack so she would like to know how Pipestone will fix that problem when the storage pit cracks. Mr. Fitzgerald stated that as part of Pipestone's procedures, daily, weekly, and monthly monitoring with the operation and maintenance logs were submitted as part of the permitting process, and it is up to Pipestone to complete those tasks. Ms. Moriarty asked how Pipestone is going to inspect the storage pit if it is full of manure, and how they would know if the cement is cracking at the bottom of the pit if it is full of manure. Mr. Fitzgerald answered that the facility is designed to meet or exceed all of the state and local requirements, and he is not aware of a

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situation with any of Pipestone's farms where that has been an issue. The first farm was constructed in 1989 and all the farms are still in operation.

Ms. Mines Bailey had no- questions.

In response to questions from Mr. Holzbauer, Mr. Fitzgerald stated that there are monitoring wells near the storage pit that can be used to detect leaks.

Patricia Moriarty was administered the oath by the court reporter. She testified that she lives two miles east of the site. She and her husband are concerned about the reduction in water because they have trouble getting enough water at times to water everything. One of Ms. Moriarty's neighbors installed an artesian well which, after four or five hours, pumps mud. She said wells need to be monitored because manure will seep down into the well. Ms. Moriarty said she has concerns about modern-day cement and she is concerned that the manure will leak into the aquifer and in her well. She said there are abandoned wells on this property, and she does not know if they have been plugged or not. She is concerned about possible contamination with those wells also.

Neither Mr. Wilkenson nor Ms. Mines Bailey had questions from Ms. Moriarty.

Responding to a question from Mr. Holzbauer, Ms. Moriarty stated that the abandoned wells are located on old farm sites. Mr. Holzbauer stated that the abandoned wells are required by law to be plugged properly, so that should have been done.

Chairman Hutmacher stated that he believes Exhibits B and C include well and test hole plugging reports for the wells Ms. Moriarty is talking about.

The parties offered closing statements. Ms. Mines Bailey and Mr. Wilkenson requested that the board grant the water permit with qualifications. Ms. Moriarty stated that the chief engineer recommended approval because this is in the public interest. She said this is an out-of-state private company and a private landowner and the majority of the pigs, when slaughtered, will be sent to foreign countries like China. She asked how that will benefit South Dakota, especially local people that must live near the facility and face problems with water quality and quantity.

Chairman Hutmacher requested board action.

Motion by Freeman, seconded by Dixon, to approve Water Permit Application No. 8413-3, Ratio, LLC, subject to the qualifications set forth by the chief engineer, as modified during the chief engineer's testimony. A roll call vote was taken, and the motion carried unanimously.

Ms. Mines Bailey will prepare proposed Findings of Fact and Conclusions of Law and provide them to the parties by November 10, 2020. Alternative Findings of Fact and Conclusions of Law or objections are due by November 20, 2020.

CANCELLATION CONSIDERATIONS: Prior to the meeting, the board members received the board packet, which included a table listing the proposed cancellations, the notices of cancellation, and the chief engineer's recommendations. Ron Duvall pointed out the following correction to the cancellation table: Water Permit "8234-3" should be "8284-3."

Mr. Duvall reported that once a water right/permit is approved, the right/permit holder has five years to construct it. Once it is constructed, the Water Rights Program inspects it, a license is issued, and if the permit holder continues to use the water, the water right/permit lasts forever. Cancellation is possible due to non-construction, abandonment, or forfeiture.

Mr. Duvall presented the 20 water rights/permits that were scheduled for cancellation. The owners were notified of the hearing and the reason for cancellation. The department received no comments or letters in response to the notices of cancellation.

None of the right/permit holders were present at the meeting.

The following water rights/permits were recommended for cancellation for the reasons listed.

DIVISION I WATER RIGHT AND VESTED WATER RIGHT

Number	Original Owner	Present Owner(s) & Other Persons Notified	Reason
RT 1163-1	Town of Buffalo	Same (% Deb Johnson, Finance Officer & Ryan Smith, PWD)	Abandonment/Forfeiture
VR 1178A-1	Town of Buffalo	Same (% Deb Johnson, Finance Officer & Ryan Smith, PWD)	Abandonment/Forfeiture

DIVISION II WATER PERMIT AND WATER RIGHT

PE 1343-2	Maurice Fite	Maurice Fite & Jim Wheeler	Abandonment
RT 1905-2	Black Hills Jellystone RV Park	Black Hills Power Inc (% Scott A Buchholz)	Abandonment

DIVISION III WATER PERMITS AND WATER RIGHTS

RT 1910B-3	Arthur Kneen	Lowell Wormstadt	Abandonment/Forfeiture
RT 1961C-3	Yankton Missouri River KOA	Same (% Don Starzl)	Abandonment/Forfeiture
RT 2698-3	John Collins	Josh Spilde	Abandonment/Forfeiture
RT 2982A-3	David Simons	Same	Abandonment/Forfeiture
RT 4354-3	City of Mitchell	Same (% Kyle Croce, PWD; Michelle Bathke, FO; Bob Everson, Mayor)	Abandonment/Forfeiture
PE 4441-3	Steve Sayler	Same	Abandonment/Forfeiture
RT 4790-3	Henry J Niemann	Collin Niemann	Abandonment/Forfeiture

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PE 7008A-3	Roger Hanson	Roger Hanson & Milan Hanson	Non-construction
PE 7009A-3	Roger Hanson	Roger Hanson & LaRue Hanson	Non-construction
PE 7456-3	Lucas Family Investments	Same (% Robert Lucas)	Non-construction
PE 7650-3	Mark or Nancy Lueck	Same	Non-construction
PE 7651-3	Mark or Nancy Lueck	Same	Non-construction
PE 7654-3	Darren Deckert	Same	Non-construction
PE 8139-3	Joe Pechous	Same	Non-construction
PE 8284-3	Berg Farms LLC	Same (% Luke Berg)	Abandonment
PE 8356-3	City of Sioux Falls	Same (% Mark Cotter, PWD; Andrew Berg)	Abandonment

Motion by Freeman, seconded by Bjork, to accept the chief engineer's recommendations for cancellation of the 20 water rights/permits for the reasons listed. A roll call vote was taken, and the motion carried unanimously.

FUTURE USE REVIEWS: Included in the board packet the board members received prior to the meeting was a table listing nine future use permits up for a seven-year review. Mr. Duvall reported that certain entities, such as water distribution systems for municipalities and rural water systems, can reserve water for future needs.

State law requires future use permits to be reviewed by the Water Management Board every seven years, and it requires the permit holder to demonstrate a reasonable need for the future use permit.

Included in the board packet were letters from the entities requesting that they be allowed to retain their future use permits, the Chief Engineer's recommendations, and the Affidavits of Publication showing that today's hearing was public noticed. No letters in opposition were received in response to the public notices.

The chief engineer recommended that the following Future Use permits remain in effect for the amounts listed.

No.	Name	Amount Remaining in Reserve	Source
369-1	City of Belle Fourche	2,478 AF	Spearfish Creek alluvium, Madison & Minnelusa

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427-3	City of Mitchell	5,765 AF	Firesteel Creek
747-3	City of Madison	1,033 AF	Big-Sioux:Northern Skunk Ck
1289-3	City of Garretson	235 AF	Sioux Quartzite Aquifer
3142-3	City of Mitchell	5,765 AF	Missouri River
4051-3	Town of Florence	38 AF	Prairie Choteau Aquifer
4053B-3	Town of South Shore	192 AF	Antelope Valley Aquifer
5643-3	Kingbrook RWS	425 AF	Big-Sioux:Northern Skunk Ck
6705-3	TM RW District	210 AF	Upper Vermillion:Missouri
7853-3	Sioux RWS	2,400 AF	Big Sioux:Brookings

Motion by Holzbauer, seconded by Dixon, that the future use permits remain in effect for the amounts listed. A roll call vote was taken, and the motion carried with Bjork, Dixon, Freeman, Holzbauer, Larson, and Hutmacher voting aye. Comes abstained.

WATER PERMIT APPLICATION NO. 8344-3, CITY OF LAKE NORDEN: Mr. Gronlund reported that the city of Lake Norden in Hamlin County applied for a water permit application to appropriate 1,458 acre feet of water at a diversion rate of 2.11 cfs (950 gpm). The application was filed based on their current wellfield being high in iron and manganese. The wellfield is completed into the Big Sioux:Brookings aquifer.

Early in the department's review of the application, the new water source was determined to be the Prairie Coteau aquifer. The Prairie Coteau aquifer is a discontinuous aquifer and made up of many glacial deposits. In this instance, there was not sufficient information on the aerial extent of the deposit to determine if unappropriated water is available or the potential impact on existing water rights.

In discussions with the city's consultant, a decision was made to conduct an aquifer performance or pump test to learn more about the aquifer. A recommendation was made for deferral for further study prior to the staff report being prepared. The application was public noticed for today's hearing with a deferral recommendation. No one petitioned to intervene in the hearing process.

Since the time of the public notice, Lake Norden hired a consultant to conduct an aquifer performance test, and last week the department received a report from the consultant. The department is now conducting a review and will prepare a standard report for the board. It is anticipated this matter will be presented to the Board at its December meeting.

Mr. Gronlund recommended that the board defer the application for further study.

Motion by Freeman, seconded by Holzbauer, to defer Water Permit Application No. 8433-3, City of Lake Norden. A roll call vote was taken, and the motion carried unanimously.

Mr. Comes departed from the meeting at 3:15 p.m.

CONSIDER FINDINGS OF FACT, CONCLUSIONS OF LAW, AND FINAL DECISION IN THE MATTER OF WATER PERMIT APPLICATION NO. 8409-3, SCHLEY FARMS & SCHLEY REAL ESTATE, LLP: David McVey, Assistant Attorney General, stated that applicant's proposed Findings of Fact and Conclusions of Law were submitted by Mr. Taylor. Objections to the applicant's proposed Findings of Fact, Conclusions of Law, and Final Decision and the chief engineer's proposed Findings of Fact, Conclusions of Law and Final Decision were submitted by Ms. Mines Bailey.

Mr. McVey stated that in compliance with SDCL 1-26-25, the proposed Findings of Fact, Conclusions of Law are accepted, modified or rejected as follows:

Applicants Proposed Findings of Fact and Conclusions of Law: The proposed facts set forth in paragraphs 2, 9, 11, 12, 14-16, 19, 21-29, and 31- 37 are accepted.

The proposed facts set forth in paragraphs 1, 3-8, 10, 13, 17, 18, 20, and 30 are accepted as modified herein.

Water Rights Proposed Findings of Fact and Conclusions of Law: The proposed facts set forth in paragraphs 1, 2, 4, 5, 7, 8, 11, 14-37 are accepted.

The proposed facts set forth in paragraphs 3, 6, 10, 13 are accepted as modified herein.

No facts proposed by the Water Rights Program were fully rejected.

Application No. 8409-3 is granted subject to the following permit qualifications:

1. Water Permit No. 8409-3 authorizes an impoundment with a storage capacity of 22 acre-feet of water on Mud Creek.
2. The permit holder shall install a low flow bypass mechanism in the dam.
3. Low flows as needed for downstream domestic use, including livestock water and prior rights must be by-passed. The bypass during periods of low flow is only required to the extent that there is inflow upstream of the dam. The permit holder is not required to bypass stored water if there is not inflow into the dam.

Mr. McVey noted that his proposed Findings of Fact, Conclusions of Law, and Final Decision incorporates the chief engineer's recommendations.

Motion by Freeman, seconded by Larson, to adopt the Findings of Fact, Conclusions of Law, and Final Decision in the matter of Water Permit Application No. 8409-2, Schley Farms & Schley Real Estate, LLP, as proposed by board attorney McVey. A roll call vote was taken, and the motion carried with Bjork, Freeman, Holzbauer, Larson, and Hutmacher voting aye. Dixon abstained and Comes was absent.

CONSIDER FINDINGS OF FACT, CONCLUSIONS OF LAW, AND FINAL DECISION IN THE MATTER OF WATER PERMIT APPLICATION NO. 2805-2, R & J, LLC: Mr. McVey stated that the proposed Findings of Fact, Conclusions of Law, and Final Decision was prepared by Ms. Mines Bailey. Mr. McVey received no objections or alternative Findings of Fact, Conclusions of Law, and Final Decision.

The final decision states that the board enters its determination that Water Permit Application No. 2805-2 is granted with the following qualifications:

1. The wells approved under this Permit will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner under this Permit shall control his withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
2. The wells authorized by Permit No. 2805-2 shall be constructed by a licensed well driller and construction of the well and installation of the pump shall comply with Water Management Board Well Construction Rules, Chapter 74:02:04 with the well casing pressure grouted (bottom to top) pursuant to Section 74:02:04:28.
3. The permit holder shall report to the Chief Engineer annually the amount of water withdrawn from the wells completed into the Crystalline Rock aquifer.
4. Water Permit No. 2805-2 authorizes a total annual diversion of 4.0 acre foot of water.

Mr. Bjork stated that a suggested revision was submitted by Lon Buehner. He asked if any action is being considered on Mr. Buehner's suggestions about the potential lack of water rights or the over-use of water in some of these areas.

Mr. McVey did not receive a copy of Mr. Buehner's letter prior to the meeting. Chairman Hutmacher called for a break while Mr. McVey read Mr. Buehner's letter.

Mr. McVey stated that during the break he reviewed the suggested revisions submitted by Mr. Buehner, and he would construe Mr. Buehner's submittal as more of a closing argument than a set of proposed facts and conclusions, and there are no additional proposed facts which would need to be addressed.

Mr. Buehner's suggested change to Qualification No. 3 is as follows: That the permit holder shall measure the amount of water withdrawn from the wells completed into the Crystalline Rock Aquifer. The amount of water withdrawn shall be reported to the chief engineer on June 1, August 1, and the closing date of the RV park season each year.

Mr. McVey stated that the existing qualification states that the permit holder shall report to the chief engineer annually, so essentially, Mr. Buehner is proposing triple reporting by R & J.

Mr. Bjork stated that Mr. Buehner makes some significant accusations in his letter. He asked if the Water Rights Program planned to look at the accusations that Mr. Buehner has made about the lack of water rights or the over-use of water. Mr. Gronlund stated that letters will be sent to the businesses that Mr. Buehner indicates do not have a water right. The letters will ask for the water source and whether the business holds a water right associated with the water use, and if not, a water permit application will be provided.

Motion by Freeman, seconded by Larson, to adopt the Findings of Fact, Conclusions of Law, and Final Decision in the matter of Water Permit Application No. 2805-2, R & J, LLC, as proposed by board attorney McVey. A roll call vote was taken, and the motion carried with Bjork, Dixon, Freeman, Holzbauer, Larson, and Hutmacher voting aye. Comes was absent.

CONSIDER FINDINGS OF FACT, CONCLUSIONS OF LAW, AND FINAL DECISION IN THE MATTER OF WATER PERMIT APPLICATION NO. 1992-1, TOWN OF BUFFALO: Mr. McVey stated that the proposed Findings of Fact, Conclusions of Law, and Final Decision were prepared by Ms. Mines Bailey. No alternative proposed Findings of Fact, Conclusions of Law, and Final Decision were submitted.

The final decision states that the board enters a determination that Water Permit Application No. 1992-1 is granted with the following qualifications:

1. The well approved under this Permit will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner under this Permit shall control his withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
2. The well authorized by Permit No. 1992-1 shall be constructed by a licensed well driller and construction of the well and installation of the pump shall comply with Water Management Board Well Construction Rules, Chapter 74:02:04 with the well casing pressure grouted (bottom to top) pursuant to Section 74:02:04:28.
3. The permit holder shall report to the Chief Engineer annually the amount of water withdrawn from the Hell Creek aquifer.
4. Water Permit No. 1992-1 authorizes a total annual diversion of 82 acre foot of water.

Motion by Freeman, seconded by Bjork, to adopt the Findings of Fact, Conclusions of Law, and Final Decision in the matter of Water Permit Application No. 1992-1, Town of Buffalo. A roll call vote was taken, and the motion carried with Bjork, Dixon, Freeman, Holzbauer, Larson, and Hutmacher voting aye. Comes was absent.

ADJOURN: Motion by Freeman, seconded by Holzbauer, to adjourn the meeting. Motion carried.

A court reporter was present for the hearings, and a transcript of the proceedings may be obtained by contacting Jacqueline K. Perli Reporting, Inc., dba Black Hills Reporting, 1601 Mt. Rushmore Road, #3280, Rapid City, SD 57701, telephone number (605) 721-2600.

The meeting was also digitally recorded, and the recording is available on the department's website at <http://denr.sd.gov/boards/schedule.aspx>.

Approved this ____ day of December 2020.

Water Management Board

Motion by Freeman, seconded by Larson, to adopt the Findings of Fact, Conclusions of Law, and Final Decision in the matter of Water Permit Application No. 2805-2, R & J, LLC, as proposed by board attorney McVey. A roll call vote was taken, and the motion carried with Bjork, Dixon, Freeman, Holzbauer, Larson, and Hutmacher voting aye. Comes was absent.

CONSIDER FINDINGS OF FACT, CONCLUSIONS OF LAW, AND FINAL DECISION IN THE MATTER OF WATER PERMIT APPLICATION NO. 1992-1, TOWN OF BUFFALO: Mr. McVey stated that the proposed Findings of Fact, Conclusions of Law, and Final Decision were prepared by Ms. Mines Bailey. No alternative proposed Findings of Fact, Conclusions of Law, and Final Decision were submitted.

The final decision states that the board enters a determination that Water Permit Application No. 1992-1 is granted with the following qualifications:

1. The well approved under this Permit will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner under this Permit shall control his withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
2. The well authorized by Permit No. 1992-1 shall be constructed by a licensed well driller and construction of the well and installation of the pump shall comply with Water Management Board Well Construction Rules, Chapter 74:02:04 with the well casing pressure grouted (bottom to top) pursuant to Section 74:02:04:28.
3. The permit holder shall report to the Chief Engineer annually the amount of water withdrawn from the Hell Creek aquifer.
4. Water Permit No. 1992-1 authorizes a total annual diversion of 82 acre foot of water.

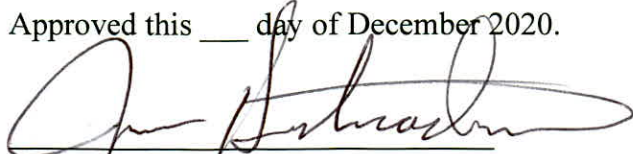
Motion by Freeman, seconded by Bjork, to adopt the Findings of Fact, Conclusions of Law, and Final Decision in the matter of Water Permit Application No. 1992-1, Town of Buffalo. A roll call vote was taken, and the motion carried with Bjork, Dixon, Freeman, Holzbauer, Larson, and Hutmacher voting aye. Comes was absent.

ADJOURN: Motion by Freeman, seconded by Holzbauer, to adjourn the meeting. Motion carried.

A court reporter was present for the hearings, and a transcript of the proceedings may be obtained by contacting Jacqueline K. Perli Reporting, Inc., dba Black Hills Reporting, 1601 Mt. Rushmore Road, #3280, Rapid City, SD 57701, telephone number (605) 721-2600.

The meeting was also digitally recorded, and the recording is available on the department's website at <http://denr.sd.gov/boards/schedule.aspx>.

Approved this ____ day of December 2020.



Water Management Board

WATER MANAGEMENT BOARD MEETING

October 7, 2020

Qualifications: wi - well interference wcr - well construction rules iq - irrigation questionnaire lf - low flow

Unopposed New Water Permit Applications Issued Based on the Chief Engineer Recommendations

No.	Name	Address	County	Amount	Use	Source	Qualifications
1995-1	Black Hawk Water User Dist.	Black Hawk	MD	1,300 AF	future use	Madison Aquifer	3 special
1997-1	Bear Butte Valley Water Inc	Sturgis	MD	0.89 cfs	rws	1 well-Madison Aquifer	wi, 3 special
1998-1	Dakota Cable Solutions	Black Hawk	MD	0.11 cfs	com/industrial	1 well-Madison Aquifer	wi, 3 special
2812-2	Canyon Springs Sanitary Dist	Rapid City	PE	0.22 cfs	wds	1 well-Madison Aquifer	wi, wcr, 3 special
8427-3	L. G. Everist Inc	Sioux Falls	MA	3.56 cfs	commercial	pond/dugout	3 special
8429-3	Norman Thorstenson	Selby	CA	1.78 cfs	60 acres	1 well-Grand Aquifer	wi, wcr, iq, 1 special
8430-3	Laverne Neuharth	Eureka	MP	0.89 cfs	66 acres	1 well-Spring Creek McPherson	wi, iq
8431-3	Hillcrest Golf & Country Club	Yankton	YA	1.89 cfs	27 add'l ac	3 wells-Lower James:Missouri	wi, iq, 2 special
8432-3	City of Pierre	Pierre	HU	4480.6 AF	municipal	Missouri River	1 special
8434-3	Dahlerup Family Trust	Yankton	YA	no add'l	129 acres	1 well-Lower James:Missouri	wi, iq
8436-3	New Fashion Pork	Jackson MN	MR	0.06 cfs	commercial	1 well-Floyd:East James	wi, wcr, 4 special

Future Use Reviews

No.	Name	Address	County	Amount Remaining in Reserve	Use	Source	Qualifications
369-1	City of Belle Fourche	Belle Fourche	LA	2,478 AF	municipal	Spearfish Creek alluvium, Madison & Minnelusa	none
427-3	City of Mitchell	Mitchell	DN	5,765 AF	municipal	Firesteel Creek	none
747-3	City of Madison	Madison	LK	1,033 AF	municipal	Big-Sioux:Northern Skunk Ck	none
1289-3	City of Garretson	Garretson	MA	235 AF	municipal	Sioux Quartzite Aquifer	none
3142-3	City of Mitchell	Mitchell	DN	5,765 AF	municipal	Missouri River	none
4051-3	Town of Florence	Florence	CD	38 AF	municipal	Prairie Choteau Aquifer	none
4053B-3	Town of South Shore	South Shore	CD	192 AF	municipal	Antelope Valley Aquifer	none
5643-3	Kingbrook RWS	Arlington	KG	425 AF	rural water	Big-Sioux:Northern Skunk Ck	none
6705-3	TM RW District	Parker	TU	210 AF	rural water	Upper Vermillion:Missouri	none
7853-3	Sioux RWS	Watertown	CD	2,400 AF	rural water	Big Sioux:Brookings	none



Overview

- History
- Statutes
- Observation Well Analysis
- Potentiometric Surface
- Hydrologic Budget
 - Recharge
 - Withdrawals
- Conclusions

2

3

- 1976-1977 Appropriations from Spink County Doubled
- 1978 Applications were deferred
- 1981 End of applications
- 1984 Chief Engineer first recommends denial of an application
- 1984-2006 Seven applications denied, two withdrawn
- 2005 One application approved, *Hines v. South Dakota Dept. of Environ. And Nat'l. Resources, Hughes County 04-37*
- 2006 Seven applications approved (average annual recharge vs. average annual withdrawal)
- 2006 Two applications denied, three withdrawn
- 2011 One application approved, no new water
- 2012 Ten applications approved (observation well data)
- 2012 Nine applications recommended for denial, all withdrawn

- 2013 Twenty-Seven applications received, all recommended for denial, 16 withdrawn, 1 denied on 10/3/2013, remaining 10 were denied at 5/6/2015 Board meeting
- 2014 Two applications received, both recommended for denial, 1 withdrawn, 1 denied at 5/6/2015 Board meeting
- 2014 Legislature enacts new laws for fully appropriated aquifers
- 2015 Water Management Board determines that aquifer is fully appropriated
- 2015 Fourteen applications received
- 2015 Priority List established by random selection
- 2016-Present Ongoing Licensing inspections and amending of existing water rights, no additional applications received

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Most Recent Appropriations

- Year Approved
- Year water was first placed to beneficial use for each appropriation
- The 2015 irrigation season saw the last two appropriations place water to beneficial use

Permit No	Year Approved	Acres	Year water placed to beneficial use
6431-3	2005	91	2012
6655-3	2006	166	2006
6656-3	2006	320	2006
6676-3	2006	264	2007
6711-3	2006	304	2007
6712-3	2006	136	2009
6713-3	2006	136	2011
7295-3	2012	120	2013
7316-3	2012	272	2013
7348-3	2012	440	2014
7564-3	2012	135	2014
7565-3	2012	132	2014
7566-3	2012	132	2014
7567-3	2012	132	2014
7568-3	2012	132	2015
7569-3	2012	132	2015
7570-3	2012	132	2014

- Notice a determination that a groundwater source is fully appropriated
- Accept and hold applications for future consideration
- Create a priority list for future appropriations if unappropriated water becomes available
- Conduct a public hearing at least once every five years to review whether unappropriated water is available or not

7

- 14 Applications on Priority List
 - All for irrigation use
 - 26.27 cubic feet per second
 - 1,893 acres
- No Applications for new appropriations received since Priority List

Tulare: East James

Winter Year	SP-772	SP-773	SP-780	SP-781	SP-782	SP-783	SP-784	Average
<i>average from 1986-2019</i>	0.14	0.22	0.15	0.24	0.21	0.09	0.11	0.21
<i>average from 1990-2011</i>	0.14	0.22	0.15	0.24	0.21	0.09	0.11	0.21
<i>period of October 2010</i>	0.14	0.22	0.15	0.24	0.21	0.09	0.11	0.21
<i>period of 1986-2011</i>	0.14	0.22	0.15	0.24	0.21	0.09	0.11	0.21
<i>period of October 2010</i>	0.14	0.22	0.15	0.24	0.21	0.09	0.11	0.21
<i>average from 1986-2019</i>	0.14	0.22	0.15	0.24	0.21	0.09	0.11	0.21
<i>average from 1990-2011</i>	0.14	0.22	0.15	0.24	0.21	0.09	0.11	0.21
<i>period of October 2010</i>	0.14	0.22	0.15	0.24	0.21	0.09	0.11	0.21
<i>period of 1986-2011</i>	0.14	0.22	0.15	0.24	0.21	0.09	0.11	0.21
<i>period of October 2010</i>	0.14	0.22	0.15	0.24	0.21	0.09	0.11	0.21

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Tulare: East James

Year/Year	SP-171	SP-272	SP-282	SP-292	SP-302	SP-312	SP-322	Average
Average from 1985-2011	2.14	2.22	0.19	0.21	0.21	0.04	0.11	0.9
Average from 1985-2011, one period of Abundant	2.14	0.61	0.21	0.47	0.11	0.18	0.7	0.9
Average from 1985-2011, one period of Scarcity	2.67	0.24	0.11	0.21	0.11	0.01	0.21	0
Average from 1985-2011, one period of Moderate	2.69	0.11	0.41	0.24	0.43	0.11	0.01	0.9
Average from 1985-2011, one period of Abundant	2.14	0.11	0.11	0.14	0.14	0.03	0.01	0
Average from 1985-2011, one period of Moderate	2.69	0.11	0.11	0.11	0.11	0.01	0.01	0.9
Average from 1985-2011, one period of Scarcity	2.69	0.11	0.11	0.11	0.11	0.01	0.01	0.9
Average from 1985-2011, one period of Abundant	2.14	0.11	0.11	0.11	0.11	0.01	0.01	0.9
Average from 1985-2011, one period of Moderate	2.69	0.11	0.11	0.11	0.11	0.01	0.01	0.9
Average from 1985-2011, one period of Scarcity	2.69	0.11	0.11	0.11	0.11	0.01	0.01	0.9

1

Tulare: East James

Waters Year	SP-72	SP-73	SP-74	SP-75	SP-76	SP-77	SP-78	Average
average from 1980-2010	0.14	0.17	0.15	0.26	0.21	0.04	0.11	0.21
average from 1980-2012 (long)	0.14	0.19	0.12	0.47	0.11	0.18	0.17	0.30
Average of Double (2010)								
average from 1984-2004	0.21	0.24	0.11	0.27	0.12	0.09	0.21	0.28
Average of Double (2010)								
average from 2004-2010	0.49	0.13	0.11	0.36	0.47	0.11	0.24	0.38
average from 2010-2012	0.10	-0.21	0.14	-0.28	-0.18	-0.04	0.01	-0.09
average from 2010-2012 (long)	0.10	-0.21	0.14	-0.28	-0.18	-0.04	0.01	-0.09
Average from 2010-2012	-0.08	-0.29	0.25	-0.21	0.49	0.31	0.01	0.06

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Tulare: East James

Winter Year	SP-77P	SP-77T	SP-78G	SP-78P	SP-78T	SP-79G	SP-79P	SP-80G	Average
WINTER FROM 1980-2011	2.14	0.35	0.19	0.21	0.21	0.04	0.71	0.71	0.51
AVERAGE FROM 1980-2011, one decade of winter (2011)	2.14	0.46	0.21	0.4*	0.41	0.19	0.7*	0.7*	0.51
AVERAGE FROM 1980-2011, one decade of summer (2001)	2.2*	0.24	0.1	0.23	0.18	0.01	0.2	0.2	0.1
AVERAGE FROM 2004-2011	2.60	0.23	0.1	0.54	0.41	0.11	0.91	0.91	0.51
AVERAGE FROM 2011-2011	2.10	0.51	0.21	0.78	0.18	0.01	0.91	0.91	0.51
AVERAGE FROM 2011-2011	2.10	0.51	0.21	1.17	0.8*	0.01	0.91	0.91	0.51

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Director: East James

[illegible]

21

May 2012 (yellow)
June 2020 (purple)

23

Tulare: East James

born: East James

Goal: Create a computer model of a real-world system

How:

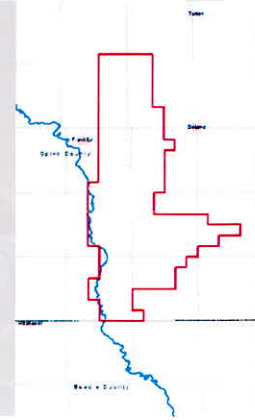
- Collect Data
 - Known Data: Land Surface altitude, Altitude of Top and Bottom of Aquifer, Irrigation Withdrawals, Observation Well Water Level
 - Estimated Data: Recharge, Evapotranspiration, Hydraulic Conductivity, Specific Yield, Storage Coefficient, and change in Evapotranspiration rate and discharge rate to surface water with a change in hydraulic head
- Put data into model
- Run model
- Compare model results to recorded observations
- Adjust the model (calibration)
- Re-run model
- Compare model results to recorded observations

Tulare: East James

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Kuiper's Model

Area: 167 square miles
 $(167 \times 640 = 106,880 \text{ acres})$
 Recharge: 0.76 inches per year
6,800 acre-feet per year



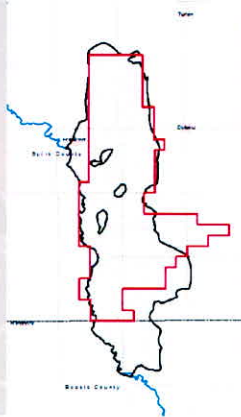
26

Kuiper's Model

Area: 167 square miles
 $(167 \times 640 = 106,880 \text{ acres})$
 Recharge: 0.76 inches per year
6,800 acre-feet per year

Buhler's Area

Area: 123,578 acres
 $(123,578/640 = 193.1 \text{ square miles})$



Tulare: East James

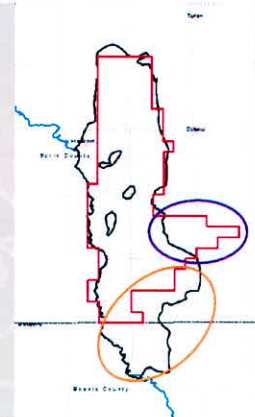
27

Kuiper's Model

Area: 167 square miles
 $(167 \times 640 = 106,880 \text{ acres})$
 Recharge: 0.76 inches per year
6,800 acre-feet per year

Buhler's Area

Area: 123,578 acres
 $(123,578/640 = 193.1 \text{ square miles})$



Tulare: East James

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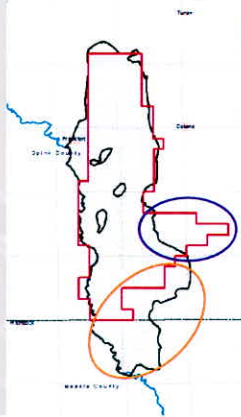
Kuiper's Model

Area: 167 square miles
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 Recharge: 0.76 inches per year
6,800 acre-feet per year

Buhler's Area

Area: 123,578 acres
 $(123,578/640 = 193.1 \text{ square miles})$

Recharge rate from Kuiper's model:
 0.76 inches per year
 7,950 acre-feet per year
 • Goodman's 2003 area
7,827 acre-feet per year
 • Buhler's 2012 area



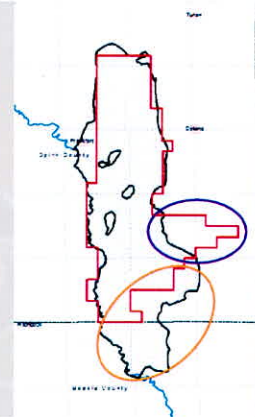
Tulare: East James

29

Kuiper's Model

Area: 167 square miles
 $(167 \times 640 = 106,880 \text{ acres})$
 Recharge: 0.76 inches per year
6,800 acre-feet per year

• **Best reasonably available information**



Tulare: East James

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Hydrologic Budget - Withdrawals

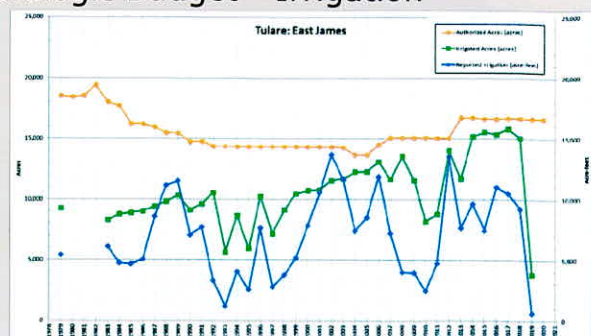
Domestic Wells: 15 acre-feet per year

Appropriative Use: 94 Water Rights, all for Irrigation

Tulare: East James

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Hydrologic Budget - Irrigation



Tulare: East James

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Hydrologic Budget - Irrigation

Average Application Rate on Irrigated Acres: 7.62 inches

Year	Domestic Wells	Authorized Acres	Estimated Average Annual Use	Estimated Average Annual Use	Estimated Average Annual Use	Estimated Average Annual Use
1979	15	16,674	10,588	6,977	7,306	8,365
1980	15	16,674	10,588	6,977	7,306	8,365
1981	15	16,674	10,588	6,977	7,306	8,365
1982	15	16,674	10,588	6,977	7,306	8,365
1983	15	16,674	10,588	6,977	7,306	8,365
1984	15	16,674	10,588	6,977	7,306	8,365
1985	15	16,674	10,588	6,977	7,306	8,365
1986	15	16,674	10,588	6,977	7,306	8,365
1987	15	16,674	10,588	6,977	7,306	8,365
1988	15	16,674	10,588	6,977	7,306	8,365
1989	15	16,674	10,588	6,977	7,306	8,365
1990	15	16,674	10,588	6,977	7,306	8,365
1991	15	16,674	10,588	6,977	7,306	8,365
1992	15	16,674	10,588	6,977	7,306	8,365
1993	15	16,674	10,588	6,977	7,306	8,365
1994	15	16,674	10,588	6,977	7,306	8,365
1995	15	16,674	10,588	6,977	7,306	8,365
1996	15	16,674	10,588	6,977	7,306	8,365
1997	15	16,674	10,588	6,977	7,306	8,365
1998	15	16,674	10,588	6,977	7,306	8,365
1999	15	16,674	10,588	6,977	7,306	8,365
2000	15	16,674	10,588	6,977	7,306	8,365
2001	15	16,674	10,588	6,977	7,306	8,365
2002	15	16,674	10,588	6,977	7,306	8,365
2003	15	16,674	10,588	6,977	7,306	8,365
2004	15	16,674	10,588	6,977	7,306	8,365
2005	15	16,674	10,588	6,977	7,306	8,365
2006	15	16,674	10,588	6,977	7,306	8,365
2007	15	16,674	10,588	6,977	7,306	8,365
2008	15	16,674	10,588	6,977	7,306	8,365
2009	15	16,674	10,588	6,977	7,306	8,365
2010	15	16,674	10,588	6,977	7,306	8,365
2011	15	16,674	10,588	6,977	7,306	8,365
2012	15	16,674	10,588	6,977	7,306	8,365
2013	15	16,674	10,588	6,977	7,306	8,365
2014	15	16,674	10,588	6,977	7,306	8,365
2015	15	16,674	10,588	6,977	7,306	8,365
2016	15	16,674	10,588	6,977	7,306	8,365
2017	15	16,674	10,588	6,977	7,306	8,365
2018	15	16,674	10,588	6,977	7,306	8,365
2019	15	16,674	10,588	6,977	7,306	8,365
2020	15	16,674	10,588	6,977	7,306	8,365
2021	15	16,674	10,588	6,977	7,306	8,365
2022	15	16,674	10,588	6,977	7,306	8,365
2023	15	16,674	10,588	6,977	7,306	8,365
2024	15	16,674	10,588	6,977	7,306	8,365
2025	15	16,674	10,588	6,977	7,306	8,365
2026	15	16,674	10,588	6,977	7,306	8,365
2027	15	16,674	10,588	6,977	7,306	8,365
2028	15	16,674	10,588	6,977	7,306	8,365
2029	15	16,674	10,588	6,977	7,306	8,365
2030	15	16,674	10,588	6,977	7,306	8,365

Tulare: East James

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Hydrologic Budget - Irrigation

Authorized Acres: 16,674 acres

Average Application Rate on Irrigated Acres: 7.62 inches

Average Utilization Rate of Authorized Acres	Estimated Average Annual Use [acre-feet per year]
100%	10,588
65.9% (1979-2011)	6,977
69% (1979-2019)	7,306
79% (2000-2019)	8,365
89% (exceeded by 6 out of 8 previous years)	9,423
94.6% (2017)	10,016
92.3% (2015-2018)	9,773
78.4% (2015-2019)	8,301

Tulare: East James

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Hydrologic Budget - Irrigation

Authorized Acres: 16,674 acres

Average Application Rate on Irrigated Acres: 7.62 inches

Average Utilization Rate of Authorized Acres	Estimated Average Annual Use [acre-feet per year]
100%	10,588
65.9% (1979-2011)	6,977
69% (1979-2019)	7,306
79% (2000-2019)	8,365
89% (exceeded by 6 out of 8 previous years)	9,423
94.6% (2017)	10,016
92.3% (2015-2018)	9,773
78.4% (2015-2019)	8,301

Tulare: East James

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Hydrologic Budget - Irrigation

Authorized Acres: 16,674 acres

Average Application Rate on Irrigated Acres: 7.62 inches

Average Utilization Rate of Authorized Acres	Estimated Average Annual Use [acre-feet per year]
100%	10,588
65.9% (1979-2011)	6,977
69% (1979-2019)	7,306
79% (2000-2019)	8,365
89% (exceeded by 6 out of 8 previous years)	9,423
94.6% (2017)	10,016
92.3% (2015-2018)	9,773
78.4% (2015-2019)	8,301

Tulare: East James

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Hydrologic Budget - Withdrawals

Domestic Wells: 15 acre-feet per year

Appropriative Use: 94 Water Rights, all for Irrigation

- Estimated withdrawal at 78.4% utilization: 8,301 acre-feet per year
- Estimated withdrawal at 92.3% utilization: 9,773 acre-feet per year

Estimated Average Annual Withdrawals: 8,316 acre-feet per year to 9,788 acre-feet per year

Tulare: East James

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Hydrologic Budget

Recharge: 6,800 acre-feet per year

Withdrawals:

- 8,316 acre-feet per year
 - Assumes 78.4% of acres are used each year
- 9,788 acre-feet per year
 - Assumes 92.3% of acres are used each year

Tulare: East James

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Conclusions

- The best information currently available indicated the Tulare: East James aquifer underlies approximately 123,578 acres of Spink and Beadle Counties
- Using the best reasonably available information, the estimated average annual recharge to the Tulare: East James aquifer is 6,800 acre-feet per year
- There are 16,674 acres authorized for irrigation
- The average application rate on irrigated acres is 7.62 inches
- The estimated average annual withdrawals for domestic and irrigation use is 8,316 acre-feet per year at 78.4% utilization of acres
- The estimated average annual withdrawals for domestic and irrigation use is 9,788 acre-feet per year at 92.3% utilization of acres
- Since the last appropriations were made in 2012, the observation well analysis shows a declining water level, indicating that the estimated average annual withdrawals from the aquifer have been exceeding the estimated average annual recharge to the aquifer

Tulare: East James

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Five-year review of the Tulare: Western Spink Hitchcock aquifer

Tulare: Western Spink Hitchcock

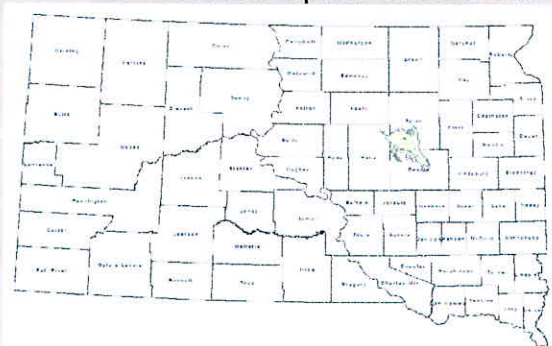
Overview

- History
- Statutes
- Observation Well Analysis
- Potentiometric Surface
- Hydrologic Budget
 - Recharge
 - Withdrawals
- Conclusions

Tulare: Western Spink Hitchcock

2

Tulare: Western Spink Hitchcock



Tulare: Western Spink Hitchcock

3

History

- 2002 Western Spink and Hitchcock management units combined into a single management unit
- 2002 22 Applications – 11 approved, 11 deferred
- 2007 33 deferred and 4 new applications considered before board, all were denied; Aquifer fully appropriated
- 2011 Six applications received; availability of unappropriated water re-evaluated
- 2012 Five of the six applications approved (observation well data)
- 2013 72 applications received, 24 were approved, remaining were denied or withdrawn
- 2013 Aquifer is fully appropriated at 10/3/13 board meeting

Tulare: Western Spink Hitchcock

4

History (continued)

- 2014 Two applications received, both recommended for denial, 1 withdrawn, 1 denied
- 2014 Legislature enacts new laws for fully appropriated aquifers
- 2015 Water Management Board public noticed that aquifer is fully appropriated
- 2015 Twenty-eight applications received
- 2015 Priority List established by random selection
- 2016-Present Ongoing Licensing inspections and amending of existing water rights, no additional applications received

Tulare: Western Spink Hitchcock

5

History (continued)

Most Recent Appropriations

- Year Approved
- Year water was first placed to beneficial use for each appropriation
- The 2018 irrigation season was the first irrigation season to see water placed to beneficial use by all recent appropriations

Permit No.	Year Approved	Acres	Year water placed to beneficial use
6330-3	2002	157	2008
6331-3	2002	157	2007
6332-3	2002	153	2003
6333-3	2002	320	2008
6334-3	2002	267.4	2003
6336-3	2002	160	2003
6337-3	2002	320	2003
6338-3	2002	320	2006
6339-3	2002	320	2003
6340-3	2002	160	2006
6343-3	2002	320	2003
7289-3	2012	270	2013
7290-3	2012	135	2013
7291-3	2012	135	2013
7292-3	2012	135	2013
7293-3	2012	135	2013
7391-3	2012	136	2014

Permit No.	Year Approved	Acres	Year water placed to beneficial use
7373-3	2013	160	2013
7551-3	2013	90	2014
7570-3	2013	280	2016
7571-3	2013	160	2015
7572-3	2013	140	2015
7573-3	2013	160	2015
7574-3	2013	160	2014
7575-3	2013	280	2016
7620-3	2013	136	2016
7637-3	2013	135	2013
7638-3	2013	135	2017
7639-3	2013	135	2014
7640-3	2013	160	2013
7685-3	2013	75	2014
7716-3	2013	160	2018
7717-3	2013	135	2014
7718-3	2013	135	2014
7719-3	2013	135	2013
7720-3	2013	135	2014
7721-3	2013	160	2017
7722-3	2013	155	2014
7723-3	2013	300	2014
7724-3	2013	300	2016
7725-3	2013	135	2015

Tulare: Western Spink Hitchcock

6

SDCL 46-2A-7 through 46-2A-7.7

- Notice a determination that a groundwater source is fully appropriated
- Accept and hold applications for future consideration
- Create a priority list for future appropriations if unappropriated water becomes available
- Conduct a public hearing at least once every five years to review whether unappropriated water is available or not

Tulare: Western Spink Hitchcock

7

Applications Held for Future Consideration

- 28 Applications on Priority List
 - All for irrigation use
 - 72.79 cubic feet per second
 - 5,374 acres
- No Applications for new appropriations received since Priority List

Tulare: Western Spink Hitchcock

8

SDCL 46-2A-7.5

Five year review of fully appropriated aquifer

- Unappropriated Water Available

SDCL 46-2A-9

Water Permit Applications

Four Criteria

- Unappropriated Water Available
- Without Unlawful Impairment of Existing Rights
- Beneficial Use
- Public Interest

Tulare: Western Spink Hitchcock

9

Availability of Unappropriated Water

SDCL 46-6-3.1

- Using best information reasonably available
- Annual Withdrawal of water cannot exceed the Estimated Average Annual Recharge

2005 Sixth Judicial Circuit Court

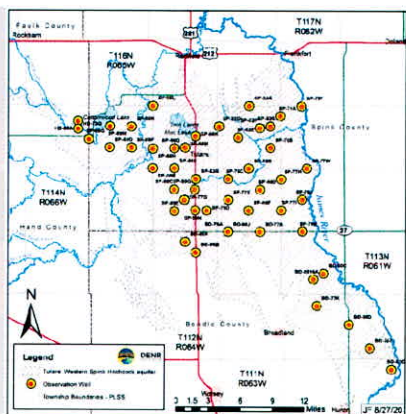
- If the Board uses the Estimated Average Annual Recharge, then the Board should also use the Estimated Average Annual Withdrawal

Tulare: Western Spink Hitchcock

10

Tulare: Western Spink Hitchcock Observation Wells

- 50 Observation Wells

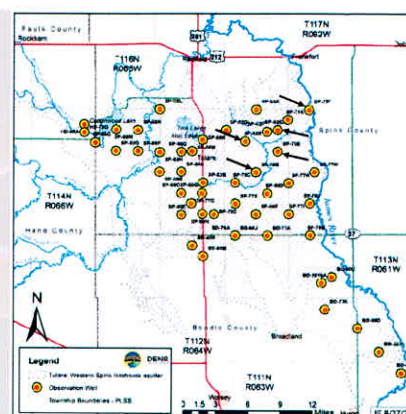


Tulare: Western Spink Hitchcock

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Tulare: Western Spink Hitchcock Observation Wells

- 50 Observation Wells
- 5 Unconfined Wells



Tulare: Western Spink Hitchcock

12

Observation Well Analysis

	SP-79F	SP-78B	SP-80B	SP-82E	SP-82G	Average
Average from 1983-2019, period of record	0.16	0.23	0.37	0.27	0.29	0.27
Average from 1983-2011, time period of Buhler (2013a)	0.19	0.36	0.43	0.23	0.27	0.30
Average from 1983-2012	0.09	0.21	0.33	0.18	0.20	0.22
Average from 1983-2018	0.09	0.22	0.25	0.17	0.17	0.18
Average from 2003-2012, time period of Buhler (2013)	0.13	0.30	0.23	0.18	0.19	0.21
Average from 2003-2018, time period of Buhler (2013) through 2018	0.12	0.10	0.08	0.19	0.12	0.12
Average from 2003-2019	0.26	0.17	0.36	0.40	0.39	0.32
Average from 2012-2018, time period since Buhler (2013a)	-0.31	-0.38	-0.48	-0.06	-0.28	-0.30
Average from 2012-2019	0.06	-0.17	0.19	0.42	0.33	0.17
Average from 2013-2018, time period since Buhler (2013)	0.09	-0.25	-0.17	0.22	-0.01	-0.02
Average from 2013-2019	0.45	-0.03	0.33	0.72	0.66	0.47

Tulare: Western Spink Hitchcock

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Observation Well Analysis

	SP-79F	SP-78B	SP-80B	SP-82E	SP-82G	Average
Average from 1983-2019, period of record	0.16	0.23	0.37	0.27	0.29	0.27
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Average from 2013-2019	0.45	-0.03	0.33	0.72	0.66	0.47

Average from 1983-2011: 0.30 feet per year rise
• Buhler's time period – 29 years

Tulare: Western Spink Hitchcock

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Observation Well Analysis

	SP-79F	SP-78B	SP-80B	SP-82E	SP-82G	Average
Average from 1983-2019, period of record	0.16	0.23	0.37	0.27	0.29	0.27
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Average from 1983-2011: 0.30 feet per year rise
• Buhler's time period – 29 years

Average from 2003-2012: 0.21 feet per year rise
• Buhler's time period – 10 years

Tulare: Western Spink Hitchcock

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Observation Well Analysis

	SP-79F	SP-78B	SP-80B	SP-82E	SP-82G	Average
Average from 1983-2019, period of record	0.16	0.23	0.37	0.27	0.29	0.27
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Average from 1983-2011: 0.30 feet per year rise
• Buhler's time period – 29 years

Average from 2003-2012: 0.21 feet per year rise
• Buhler's time period – 10 years

Average from 2013-2018: 0.02 feet per year decline
• Since Buhler's analysis – 6 years

Tulare: Western Spink Hitchcock

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Observation Well Analysis

	SP-79F	SP-78B	SP-80B	SP-81E	SP-82G	Average
Average from 1983-2019, period of record	0.16	0.25	0.37	0.27	0.29	0.27
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Average from 2013-2018, time period since Buhler (2013)	0.09	-0.25	-0.17	0.32	-0.01	-0.02
Average from 2013-2019	0.45	-0.03	0.55	0.72	0.66	0.47

Average from 1983-2011: 0.30 feet per year rise

- Buhler's time period – 29 years

Average from 2003-2012: 0.21 feet per year rise

- Buhler's time period – 10 years

Average from 2013-2018: 0.02 feet per year decline

- Since Buhler's analysis – 6 years

Average from 1983-2019: 0.27 feet per year rise

- Period of Record – 37 years

Tulare: Western Spink Hitchcock

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Observation Well Analysis

	SP-79F	SP-78B	SP-80B	SP-81E	SP-82G	Average
Average from 1983-2019, period of record	0.16	0.25	0.37	0.27	0.29	0.27
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Average from 1983-2011: 0.30 feet per year rise

- Buhler's time period – 29 years

Average from 2003-2012: 0.21 feet per year rise

- Buhler's time period – 10 years

Average from 2013-2018: 0.02 feet per year decline

- Since Buhler's analysis – 6 years

Average from 1983-2019: 0.27 feet per year rise

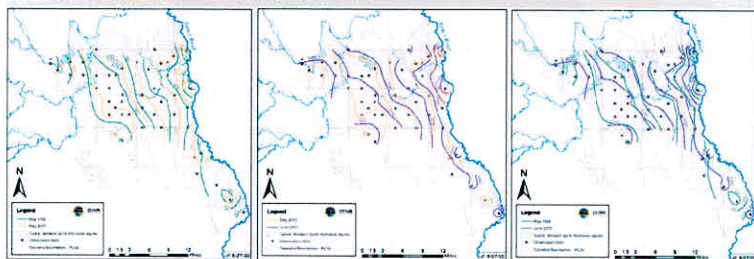
- Period of Record – 37 years

New appropriations were being made through 2002, then were made again in 2012 and 2013

Tulare: Western Spink Hitchcock

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Potentiometric Surface



May 1988 (green)
May 2013 (yellow)

May 2013 (yellow)
June 2020 (purple)

May 1988 (green)
June 2020 (purple)

Tulare: Western Spink Hitchcock

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Hydrologic Budget

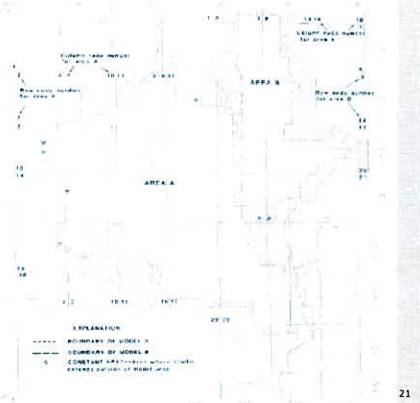
Balance of Recharge and Withdrawals

Tulare: Western Spink Hitchcock

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Kuiper's Model

Best Information Available



Tulare: Western Spink Hitchcock

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Goal: Create a computer model of a real-world system

How:

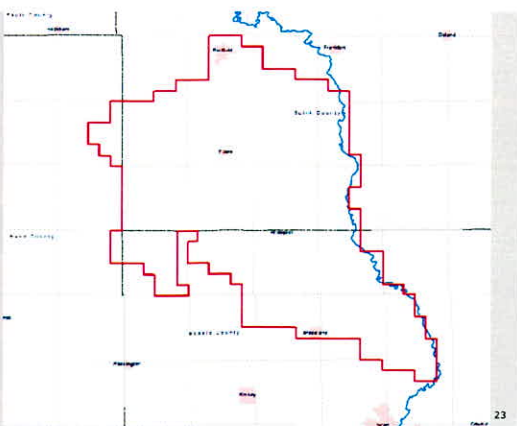
- Collect Data
 - Known Data: Land Surface altitude, Altitude of Top and Bottom of Aquifer, Irrigation Withdrawals, Observation Well Water Level
 - Estimated Data: Recharge, Evapotranspiration, Hydraulic Conductivity, Specific Yield, Storage Coefficient, and change in Evapotranspiration rate and discharge rate to surface water with a change in hydraulic head
- Put data into model
- Run model
- Compare model results to recorded observations
- Adjust the model (calibration)
- Re-run model
- Compare model results to recorded observations

Tulare: Western Spink Hitchcock

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Kuiper's Model

Area: 527 square miles
(527*640 = 337,280 acres)
Recharge: 0.83 inches per year
23,000 acre-feet per year



Tulare: Western Spink Hitchcock

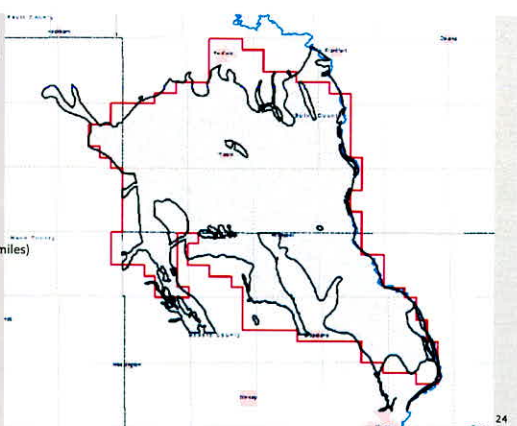
23

Kuiper's Model

Area: 527 square miles
(527*640 = 337,280 acres)
Recharge: 0.83 inches per year
23,000 acre-feet per year

Buhler's Area

Area: 263,016 acres
(263,016 / 640 = 411 square miles)



Tulare: Western Spink Hitchcock

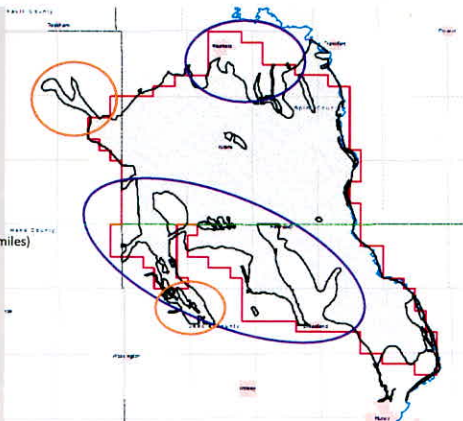
24

Kuiper's Model

Area: 527 square miles
(527*640 = 337,280 acres)
Recharge: 0.83 inches per year
23,000 acre-feet per year

Buhler's Area

Area: 263,016 acres
(263,016 / 640 = 411 square miles)



Tulare: Western Spink Hitchcock

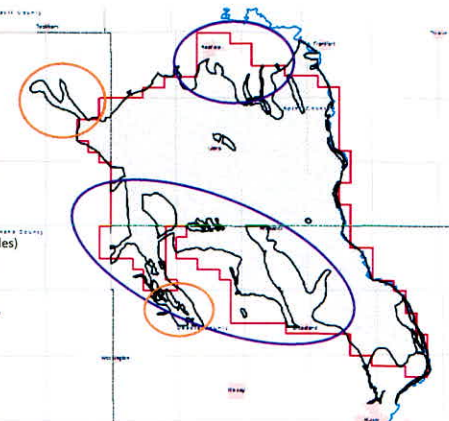
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Kuiper's Model

Area: 527 square miles
(527*640 = 337,280 acres)
Recharge: 0.83 inches per year
23,000 acre-feet per year

Buhler's Area

Area: 263,016 acres
(263,016 / 640 = 411 square miles)
Recharge rate from Kuiper's model:
0.83 inches per year
18,192 acre-feet per year
= Buhler's 2012 area



Tulare: Western Spink Hitchcock

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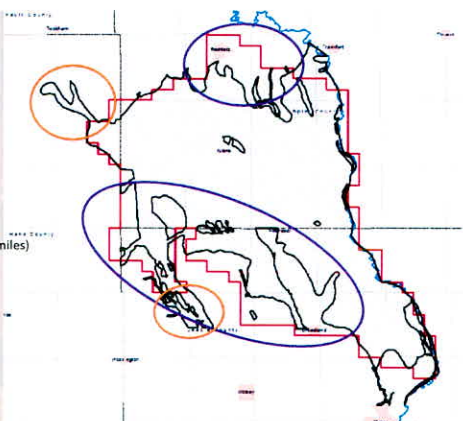
Kuiper's Model

Area: 527 square miles
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Recharge: 0.83 inches per year
23,000 acre-feet per year

Buhler's Area

Area: 263,016 acres
(263,016 / 640 = 411 square miles)
Recharge rate from Kuiper's model:
0.83 inches per year
18,192 acre-feet per year
= Buhler's 2012 area

Best reasonably available information



Tulare: Western Spink Hitchcock

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Hydrologic Budget - Withdrawals

Domestic Wells: 56 acre-feet per year

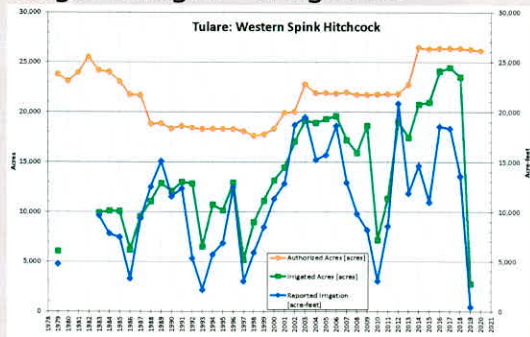
Appropriative Use: 159 Water Rights

- 2 for Commercial Use – 58 acre-feet per year
- 157 for Irrigation Use

Tulare: Western Spink Hitchcock

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Hydrologic Budget - Irrigation



Tulare: Western Spink Hitchcock

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Hydrologic Budget - Irrigation

Average Application Rate on Irrigated Acres: 9.06 inches

Year	Authorized Acres (Acres)	Reported Irrigation (Acres)	Utilization Rate (Reported/Authorized)	Average Application Rate (Inches)
1979	10,000	10,000	1.00	9.06
1980	10,000	10,000	1.00	9.06
1981	10,000	10,000	1.00	9.06
1982	10,000	10,000	1.00	9.06
1983	10,000	10,000	1.00	9.06
1984	10,000	10,000	1.00	9.06
1985	10,000	10,000	1.00	9.06
1986	10,000	10,000	1.00	9.06
1987	10,000	10,000	1.00	9.06
1988	10,000	10,000	1.00	9.06
1989	10,000	10,000	1.00	9.06
1990	10,000	10,000	1.00	9.06
1991	10,000	10,000	1.00	9.06
1992	10,000	10,000	1.00	9.06
1993	10,000	10,000	1.00	9.06
1994	10,000	10,000	1.00	9.06
1995	10,000	10,000	1.00	9.06
1996	10,000	10,000	1.00	9.06
1997	10,000	10,000	1.00	9.06
1998	10,000	10,000	1.00	9.06
1999	10,000	10,000	1.00	9.06
2000	10,000	10,000	1.00	9.06
2001	10,000	10,000	1.00	9.06
2002	10,000	10,000	1.00	9.06
2003	10,000	10,000	1.00	9.06
2004	10,000	10,000	1.00	9.06
2005	10,000	10,000	1.00	9.06
2006	10,000	10,000	1.00	9.06
2007	10,000	10,000	1.00	9.06
2008	10,000	10,000	1.00	9.06
2009	10,000	10,000	1.00	9.06
2010	10,000	10,000	1.00	9.06
2011	10,000	10,000	1.00	9.06
2012	10,000	10,000	1.00	9.06
2013	10,000	10,000	1.00	9.06
2014	10,000	10,000	1.00	9.06
2015	10,000	10,000	1.00	9.06
2016	10,000	10,000	1.00	9.06
2017	10,000	10,000	1.00	9.06
2018	10,000	10,000	1.00	9.06
2019	10,000	10,000	1.00	9.06

Tulare: Western Spink Hitchcock

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Hydrologic Budget - Irrigation

Authorized Acres:
26,104.9 acres

Average Application Rate on Irrigated Acres: 9.06 inches

Average Utilization Rate of Authorized Acres	Estimated Average Annual Use [acre-feet per year]
100%	19,709
60.1% (1979-2011)	11,845
63.4% (1979-2019)	12,496
73.6% (2003-2011)	14,506
87% (exceeded by 4 out of 8 previous years)	17,147
92.7% (2017)	18,270
85% (2012-2018)	16,753
75.6% (2012-2019)	14,900
88.2% (2015-2018)	17,384
72.6% (2015-2019)	14,309

Tulare: Western Spink Hitchcock

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Hydrologic Budget - Irrigation

Authorized Acres:
26,104.9 acres

Average Application Rate on Irrigated Acres: 9.06 inches

Average Utilization Rate of Authorized Acres	Estimated Average Annual Use [acre-feet per year]
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Tulare: Western Spink Hitchcock

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Hydrologic Budget - Irrigation

Authorized Acres:
26,104.9 acres

Average Application
Rate on Irrigated
Acres: 9.06 inches

Average Utilization Rate of Authorized Acres	Estimated Average Annual Use [acre-feet per year]
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Hydrologic Budget - Withdrawals

Domestic Wells: 56 acre-feet per year

Appropriative Use: 159 Water Rights

- 2 for Commercial Use – 58 acre-feet per year
- 157 for Irrigation Use
 - Estimated withdrawal at 88.2% utilization: 17,384 acre-feet per year
 - Estimated withdrawal at 100% utilization: 19,709 acre-feet per year

Hydrologic Budget - Withdrawals

Domestic Wells: 56 acre-feet per year

Appropriative Use: 159 Water Rights

- 2 for Commercial Use – 58 acre-feet per year
- 157 for Irrigation Use
 - Estimated withdrawal at 88.2% utilization: 17,384 acre-feet per year
 - Estimated withdrawal at 100% utilization: 19,709 acre-feet per year

Estimated Average Annual Withdrawals:

- 17,498 acre-feet per year assuming 88.2% utilization continues
- 19,823 acre-feet per year assuming full utilization of acres

Hydrologic Budget

Recharge: 18,192 acre-feet per year

Withdrawals:

- 17,498 acre-feet per year
 - Assumes 88.2% of acres are used each year
- 19,823 acre-feet per year
 - Assumes that acres will be fully utilized

Conclusions

- The best information currently available indicated the Tulare: Western Spink Hitchcock aquifer underlies approximately 263,016 acres of Spink, Beadle, and Hand Counties
- Using the best reasonably available information, the estimated average annual recharge to the Tulare: Western Spink Hitchcock aquifer is 18,192 acre-feet per year
- There are 26,104.9 acres authorized for irrigation
- The average application rate on irrigated acres is 9.06 inches
- The estimated average annual withdrawals for domestic, commercial, and irrigation use is 17,498 acre-feet per year at 88.2% utilization of acres
- The estimated average annual withdrawals for domestic, commercial, and irrigation use is 19,823 acre-feet per year at 100% utilization of acres
- Since the last appropriations were made in 2013 and excluding 2019, the observation well analysis shows a steady water level, indicating that the estimated average annual withdrawals from the aquifer have been the same as the estimated average annual recharge to the aquifer